CLAIMS

WHAT IS CLAIMED:

1. A method, comprising:

providing a semiconducting substrate;

forming a first plurality of implant regions in said substrate; and

illuminating said first plurality of implant regions with a light source in a scatterometry tool, said scatterometry tool generating a trace profile corresponding to an implant profile of said illuminated implant regions.

2. The method of claim 1, further comprising generating an additional trace profile for an additional plurality of implant regions formed in said substrate or additional substrates, said additional plurality of implant regions having an implant profile different from said first plurality of implant regions.

3. The method of claim 2, further comprising creating a library comprised of a plurality of calculated trace profiles of implant regions having varying implant profiles.

4. The method of claim 1, wherein forming a first plurality of implant regions in said substrate comprises forming a first plurality of implant regions to thereby define a grating structure in said substrate.

5. The method of claim 1, wherein said first plurality of implant regions are comprised of N-type dopant material or P-type dopant material.

6. The method of claim 1, wherein said first plurality of implant regions are illuminated using at least one of a multiple wavelength light source and a single wavelength light source.

7. The method of claim 1, wherein said implant profile is comprised of at least one of a width, a depth, a dopant concentration level, and a dopant concentration profile of said implant regions.

8. A method of measuring profiles of implant regions formed in a semiconducting substrate, comprising:

forming a plurality of implant regions in a semiconducting substrate;

illuminating said plurality of implant regions;

measuring light reflected off the substrate to generate a profile trace for said implant regions;

comparing the generated profile trace to a target profile trace; and

modifying, based upon a deviation between the generated profile trace and the target profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

9. The method of claim 8, further comprising correlating the generated profile trace to a profile trace from a library, the profile trace from the library having an associated implant region profile.

10. The method of claim 9, further comprising modifying, based upon a deviation between the generated profile trace and a profile trace from the library, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

11. The method of claim 8, wherein measuring the reflected light comprises measuring the intensity of the reflected light.

12. The method of claim 8, further comprising providing a library of calculated profile traces, each of which correspond to a unique profile of an implanted region.

13. The method of claim 8, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed prior to the implanted regions being subjected to an anneal process or a diffusion process.

14. The method of claim 8, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed after the implanted regions have been subjected to an anneal process or a diffusion process.

15. The method of claim 8, wherein modifying at least one parameter of an ion implant process comprises modifying at least one of an implant energy, an implant angle, a dopant material, and a dopant material concentration.

16. A method of measuring profiles of implant regions formed in a semiconducting substrate, comprising:

forming a plurality of implant regions in a semiconducting substrate;

illuminating said plurality of implant regions;

measuring light reflected off the substrate to generate a profile trace for said implant regions;

comparing the generated profile trace to a calculated profile trace in a library, the calculated profile trace having an associated implant region profile; and

modifying, based upon said comparison of the generated profile trace and the calculated profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

17. The method of claim 16, further comprising comparing the generated profile trace to a target profile trace from said library.

18. The method of claim 17, further comprising modifying, based upon a comparison of the generated profile trace and the target profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

19. The method of claim 16, wherein measuring the reflected light comprises measuring the intensity of the reflected light.

20. The method of claim 16, further comprising providing a library of calculated profile traces in a library, each of which correspond to a unique profile of an implanted region.

21. The method of claim 16, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed prior to the implanted regions being subjected to an anneal process or a diffusion process.

22. The method of claim 16, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed after the implanted regions have been subjected to an anneal process or a diffusion process.

23. The method of claim 16, wherein modifying at least one parameter of an ion implant process comprises modifying at least one of an implant energy, an implant angle, a dopant material, and a dopant material concentration.

24. A method of measuring profiles of implant regions formed in a semiconducting substrate, comprising:

forming a plurality of implant regions in a semiconducting substrate;

illuminating said plurality of implant regions;

measuring light reflected off the substrate to generate a profile trace for said implant regions;

providing a library comprised of a plurality of calculated profile traces, each of which correspond to a unique profile of an implanted region;

comparing the generated profile trace to at least one of said calculated profile traces from said library; and

modifying, based upon said comparison of the generated profile trace and the calculated profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

25. The method of claim 24, further comprising comparing the generated profile trace to a target profile trace.

26. The method of claim 25, further comprising modifying, based upon a deviation between the generated profile trace and the target profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

27. The method of claim 24, wherein measuring the reflected light comprises measuring the intensity of the reflected light.

28. The method of claim 24, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed prior to the implanted regions being subjected to an anneal process or a diffusion process.

29. The method of claim 24, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed after the implanted regions have been subjected to an anneal process or a diffusion process.

30. The method of claim 24, wherein modifying at least one parameter of an ion implant process comprises modifying at least one of an implant energy, an implant angle, a dopant material, and a dopant material concentration.

31. A method of measuring profiles of implant regions formed in a semiconducting substrate, comprising:

forming a plurality of implant regions in a semiconducting substrate;

illuminating said plurality of implant regions;

measuring light reflected off the substrate to generate a profile trace for said implant regions;

comparing the generated profile trace to a target profile trace; and

modifying, based upon a deviation between the generated profile trace and the target profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates, said at least one parameter comprises of at least one of an implant energy, an implant angle, a dopant material, and a dopant material concentration..

32. The method of claim 31, further comprising comparing the generated profile trace to a calculated profile trace in a library, the calculated profile trace having an associated implant region profile.

33. The method of claim 32, further comprising modifying, based upon said comparison of the generated profile trace and the calculated profile trace, at least one parameter of an ion implant process used to form implant regions on subsequently processed substrates.

34. The method of claim 31, wherein measuring the reflected light comprises measuring the intensity of the reflected light.

35. The method of claim 31, further comprising providing a library of historical profile traces, each of which correspond to a unique profile of an implanted region.

36. The method of claim 31, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed prior to the implanted regions being subjected to an anneal process or a diffusion process.

37. The method of claim 31, wherein measuring light reflected off the substrate to generate a profile trace for said implant regions is performed after the implanted regions have been subjected to an anneal process or a diffusion process.